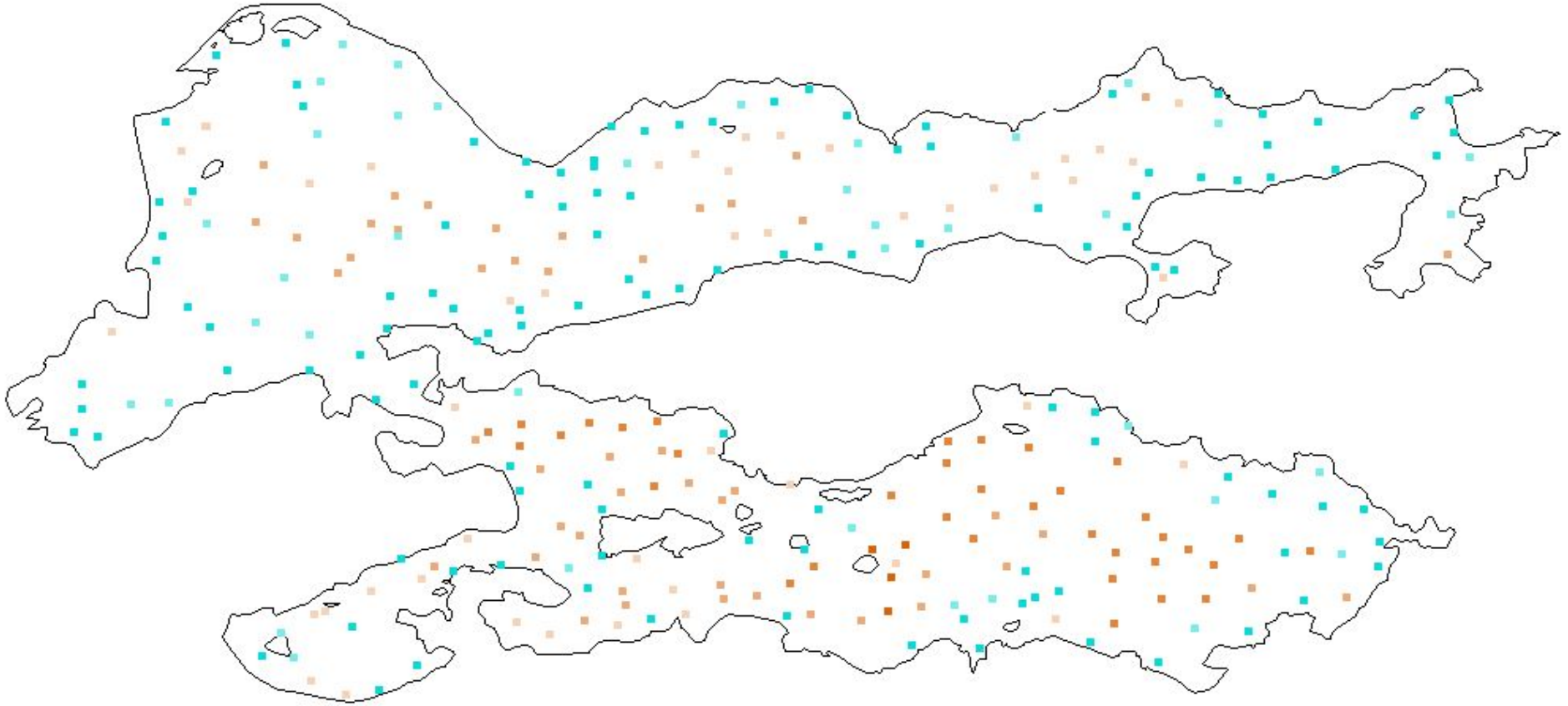
Part 2, Timothy Drexler, U.S. EPA



Maximum mercury concentration per sample location

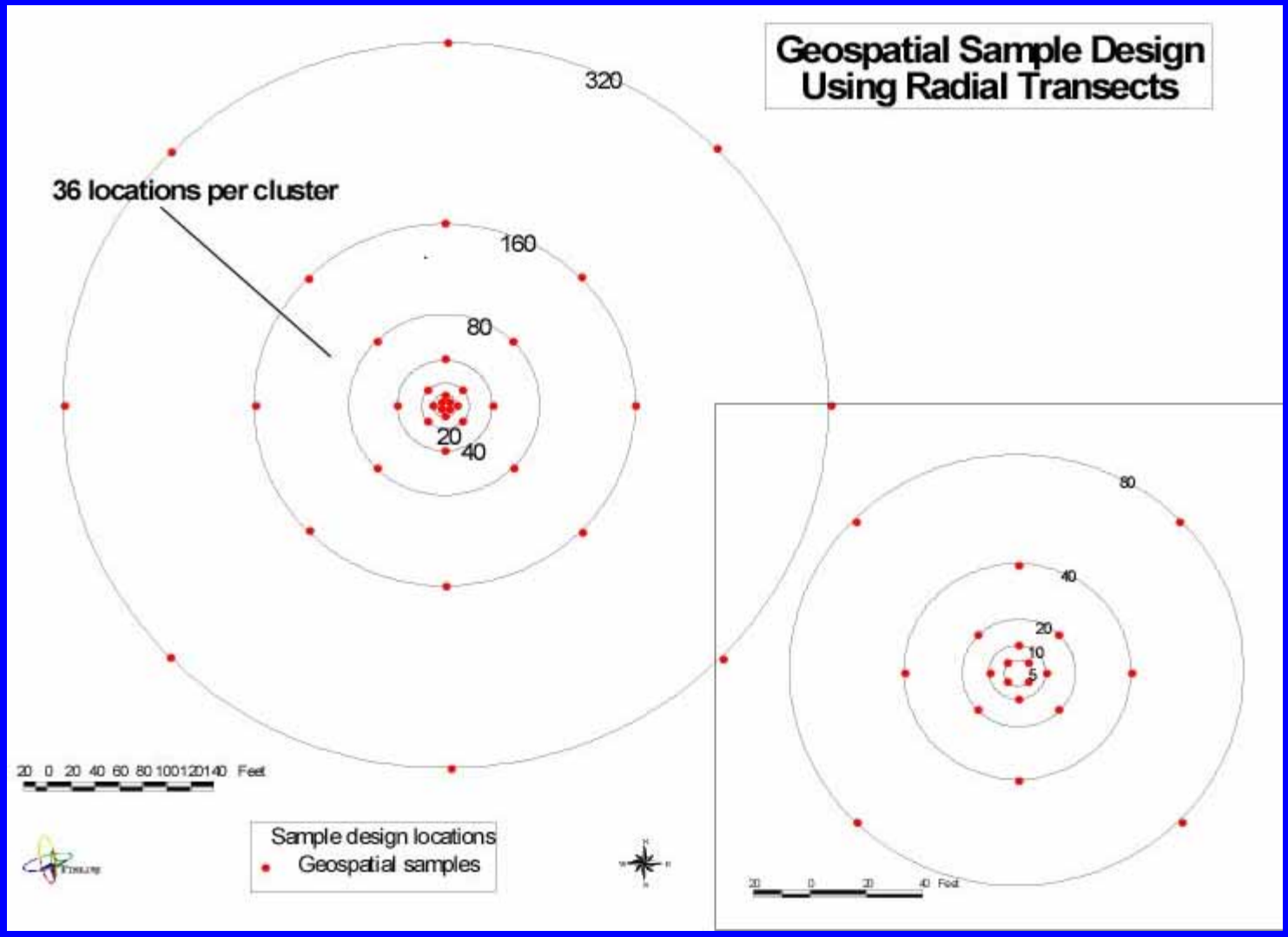
- 0 - 1 ppm
- 1 - 2 ppm
- 2 - 3 ppm
- 3 - 5 ppm
- 5 - 10 ppm
- 10 - 20 ppm
- 20 - 50 ppm

Deer Lake: Spatial distribution of all sediment samples taken in 1998 and 2000. A total of 317 unique locations were sampled with 196 ponar samples and 121 cores, totaling 507 analyses (including duplicates).
10 Jan. 01

Sample Spatial Correlation?

- Initial Sampling, Random or Grid
- Adaptive Cluster Sampling (EPA QA/G-5S)
- Generate semivariogram

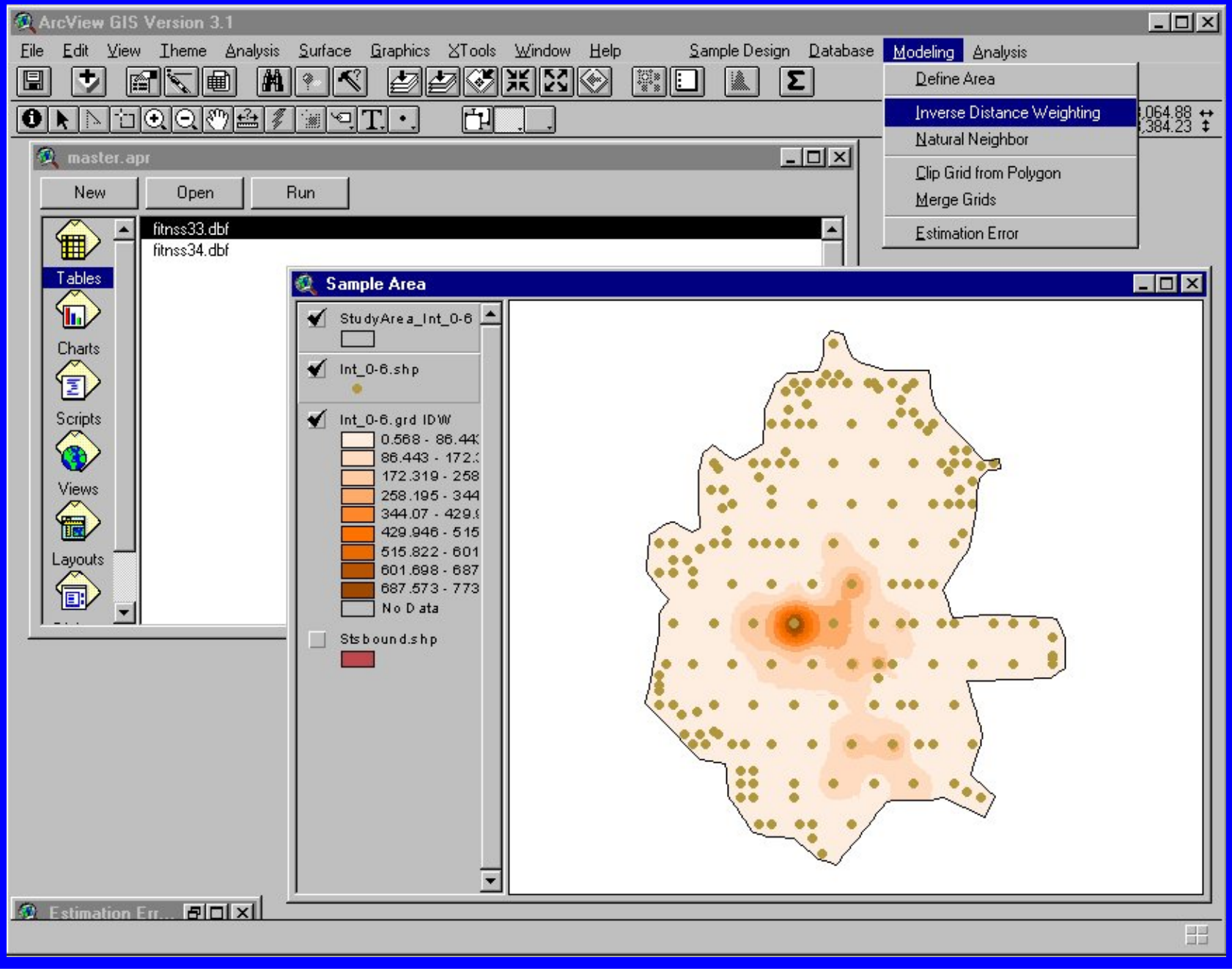
Radial Cluster Sampling



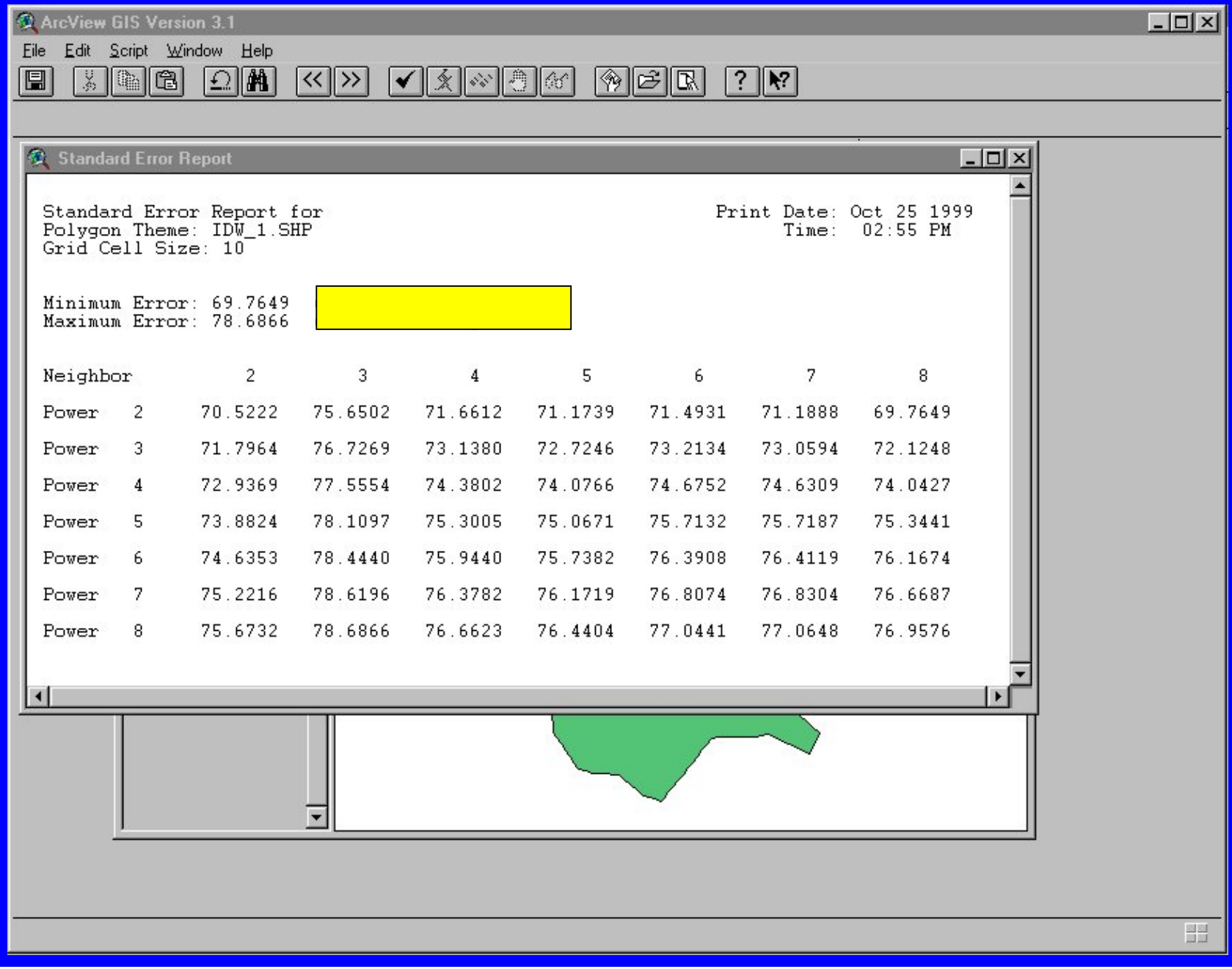
Site Modeling

- Data Interpolation
- QA/QC (error estimation, cross validation, etc.)
- Mass and Volume Calculation
- Remediation Tools
- Report Generation

Inverse Distance Weighting Interpolation

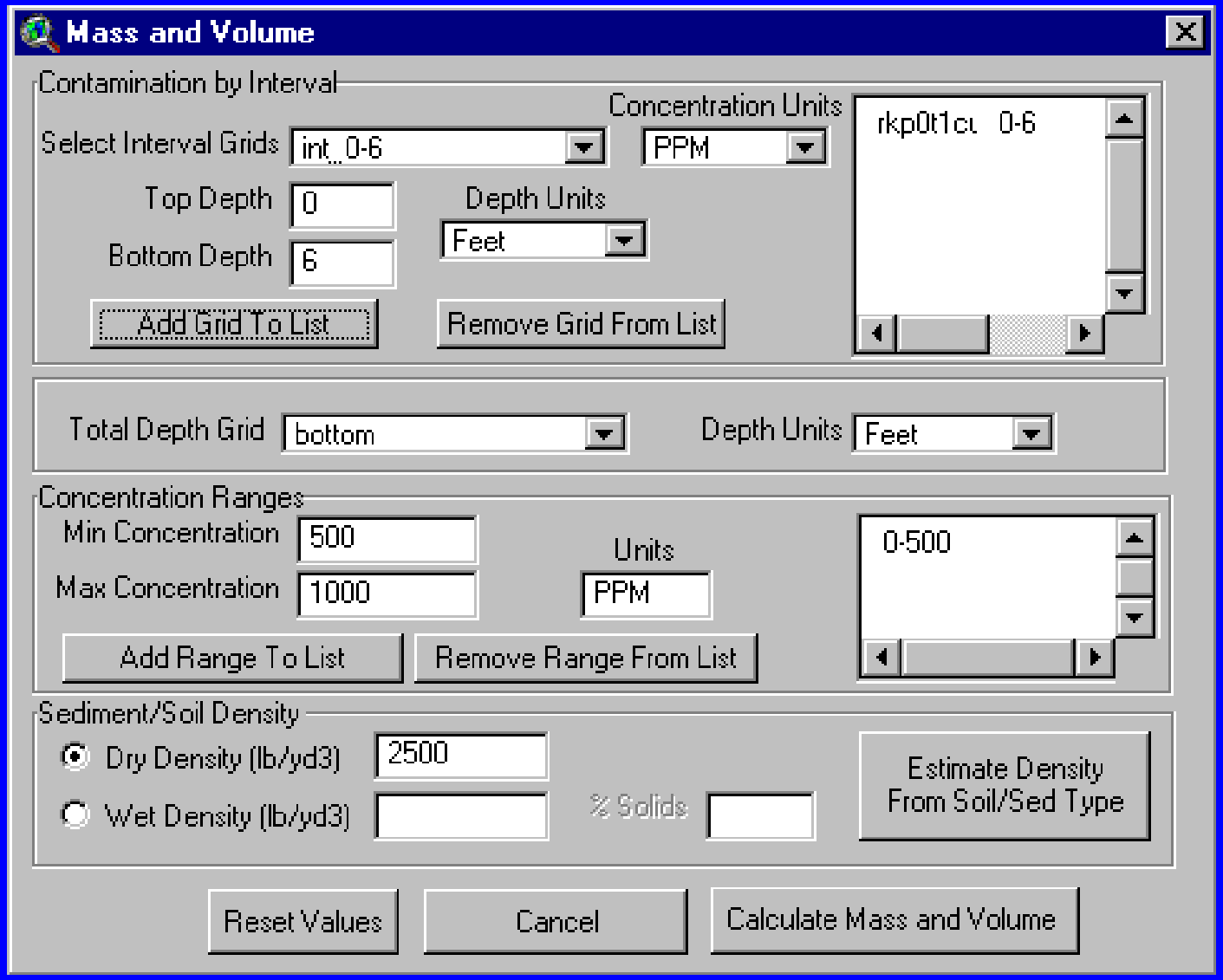


Cross validation

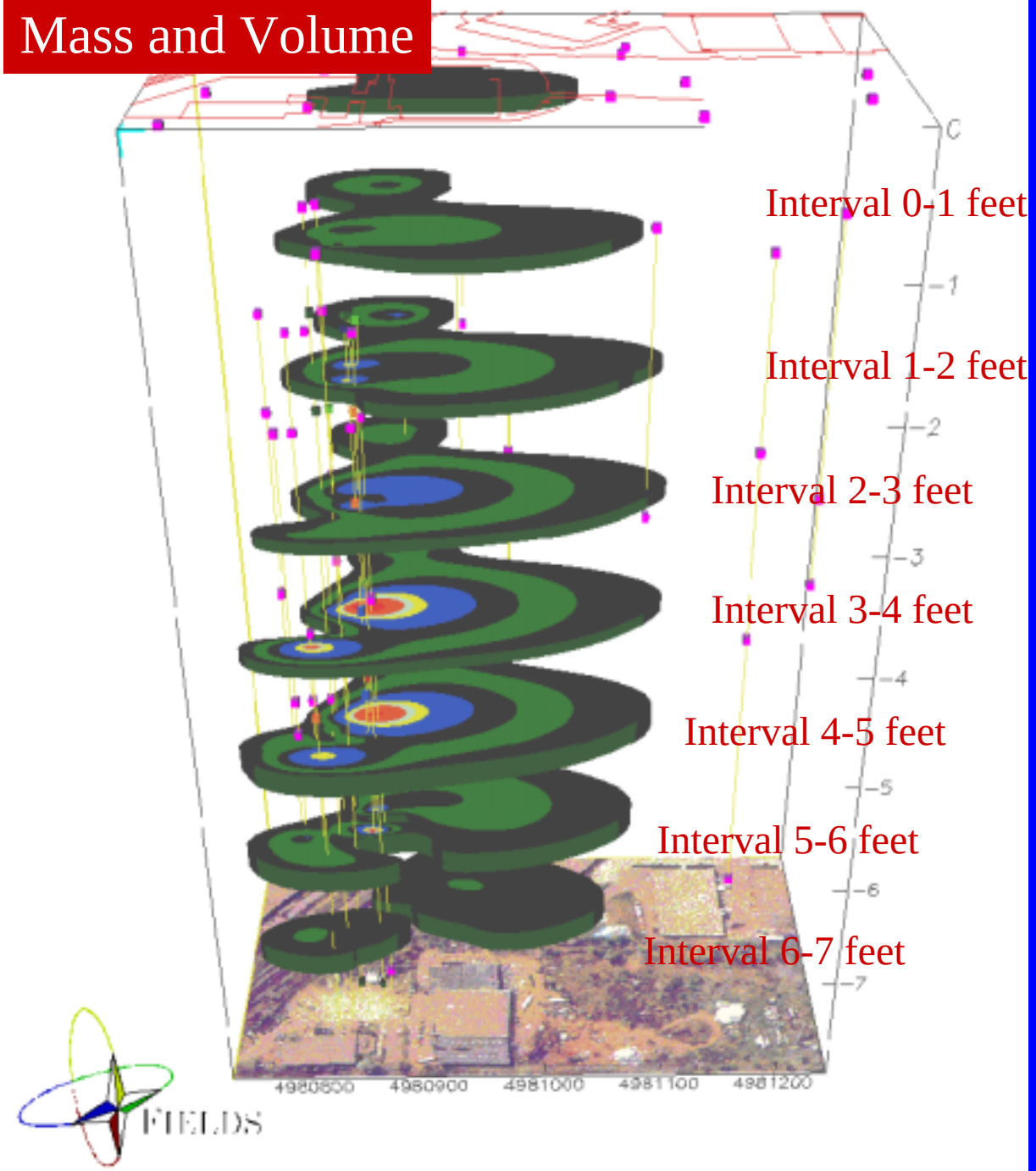


Neighbor	2	3	4	5	6	7	8
Power 2	70.5222	75.6502	71.6612	71.1739	71.4931	71.1888	69.7649
Power 3	71.7964	76.7269	73.1380	72.7246	73.2134	73.0594	72.1248
Power 4	72.9369	77.5554	74.3802	74.0766	74.6752	74.6309	74.0427
Power 5	73.8824	78.1097	75.3005	75.0671	75.7132	75.7187	75.3441
Power 6	74.6353	78.4440	75.9440	75.7382	76.3908	76.4119	76.1674
Power 7	75.2216	78.6196	76.3782	76.1719	76.8074	76.8304	76.6687
Power 8	75.6732	78.6866	76.6623	76.4404	77.0441	77.0648	76.9576

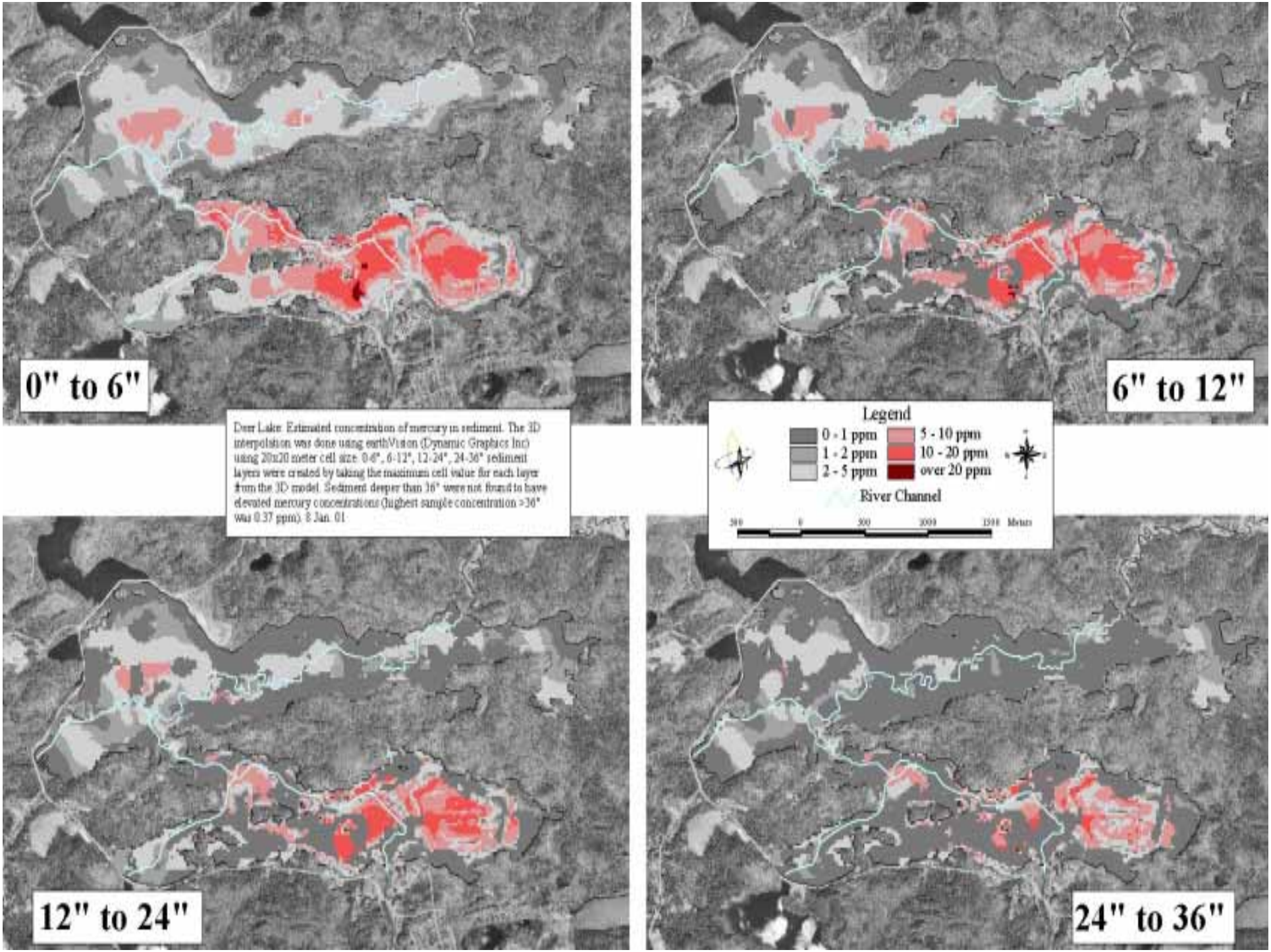
Mass and Volume Calculation



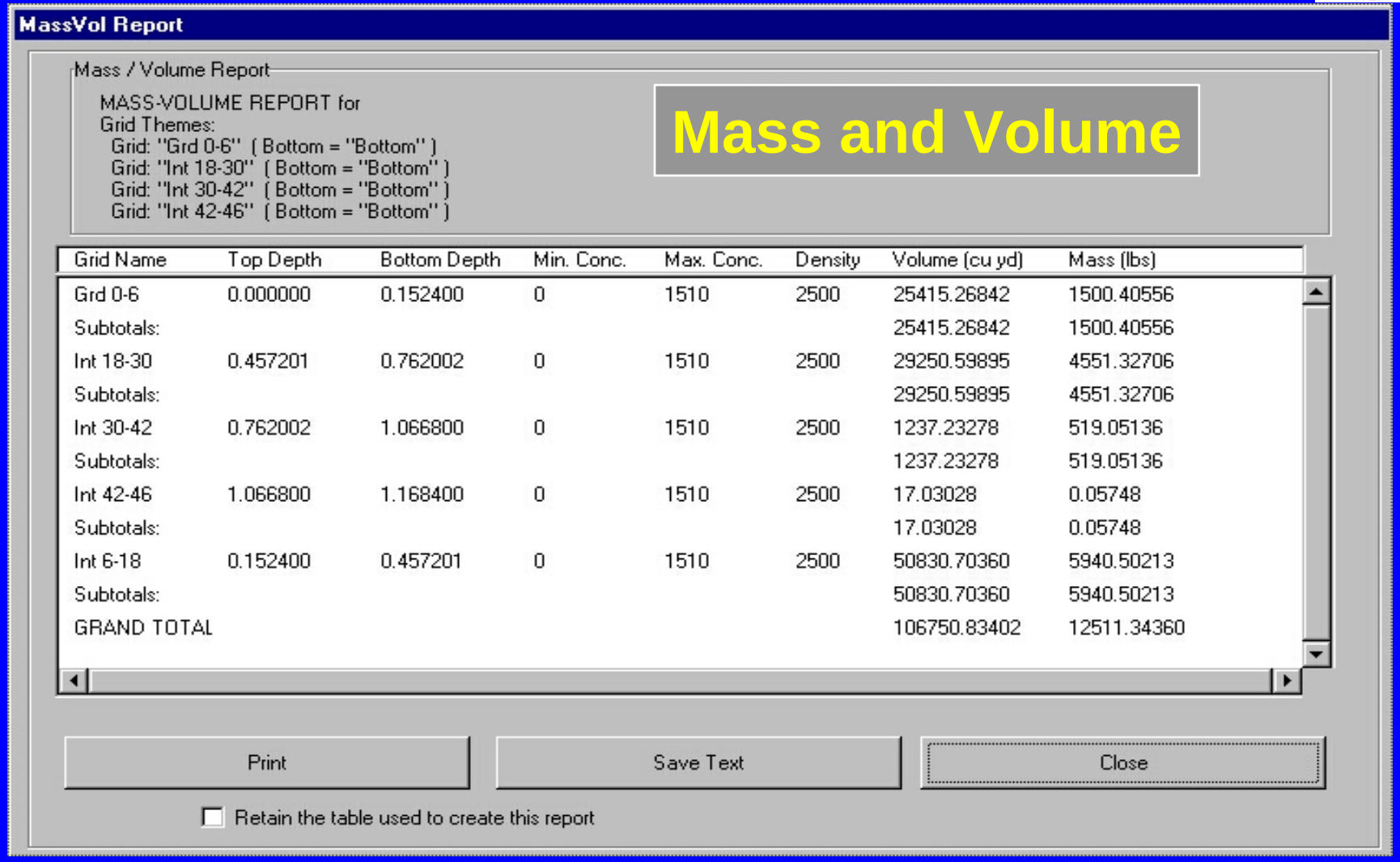
Mass and Volume



Interpolated Concentration Intervals



Deer Lake: Estimated concentration of mercury in sediment. The 3D interpolation was done using earthVision (Dynamic Graphics Inc) using 20x20 meter cell size. 0-6", 6-12", 12-24", 24-36" sediment layers were created by taking the maximum cell value for each layer from the 3D model. Sediment deeper than 36" were not found to have elevated mercury concentrations (highest sample concentration >36" was 0.37 ppm). 8 Jan. 01



Mass = Volume x Concentration x $\text{Density}_{\text{dry}}$

Or, Mass = Volume x Concentration x $\text{Density}_{\text{wet}}$ x % Solids

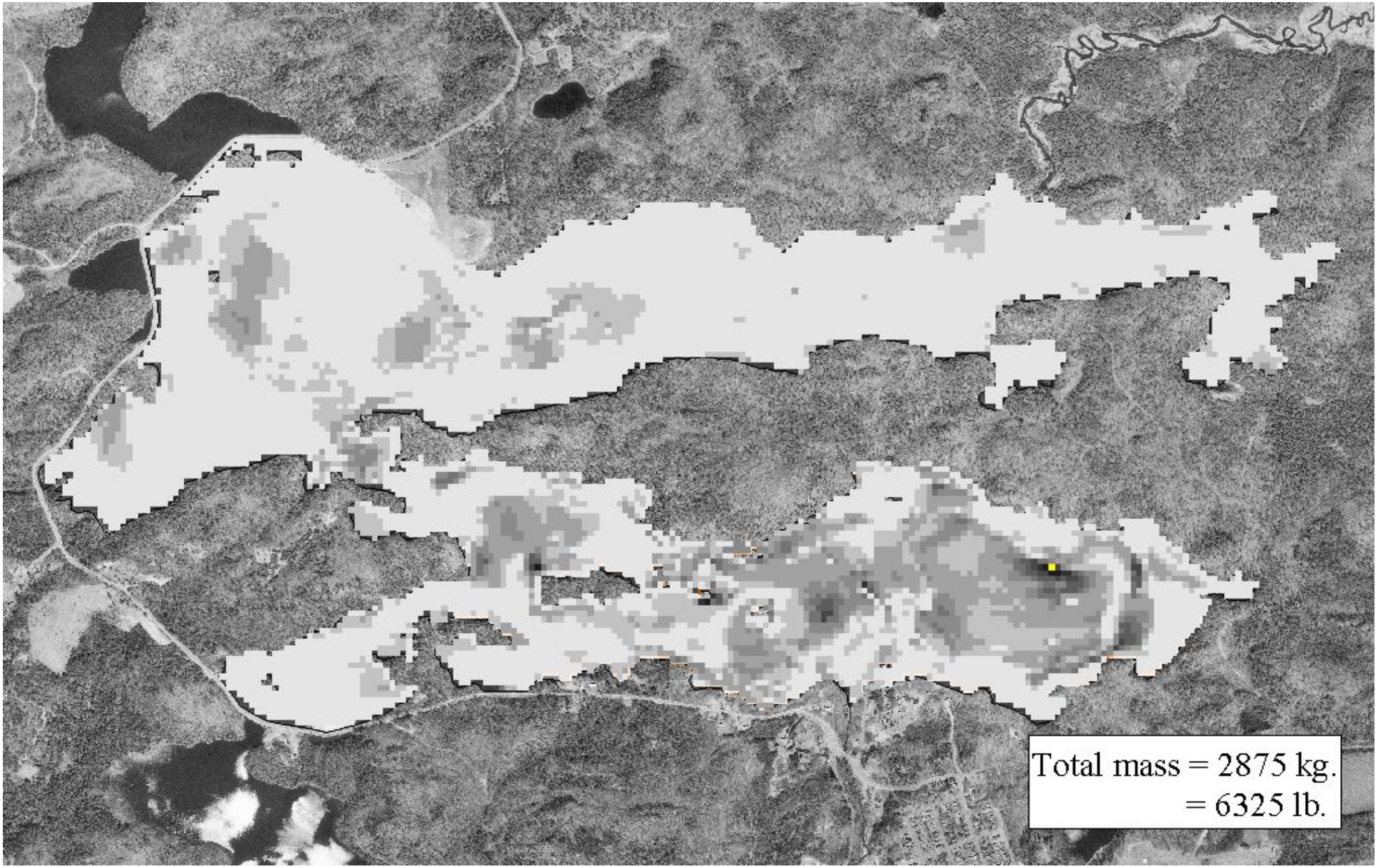


Figure 15. Deer Lake: Estimated total mass (grams) per 20x20 meter grid cell for all layers of sediment. Mass was determined from interpolated concentration, percent solid, and wet density. Greatest mass is found in the south lake section. 28 March 2001

Averaging Concentration Values

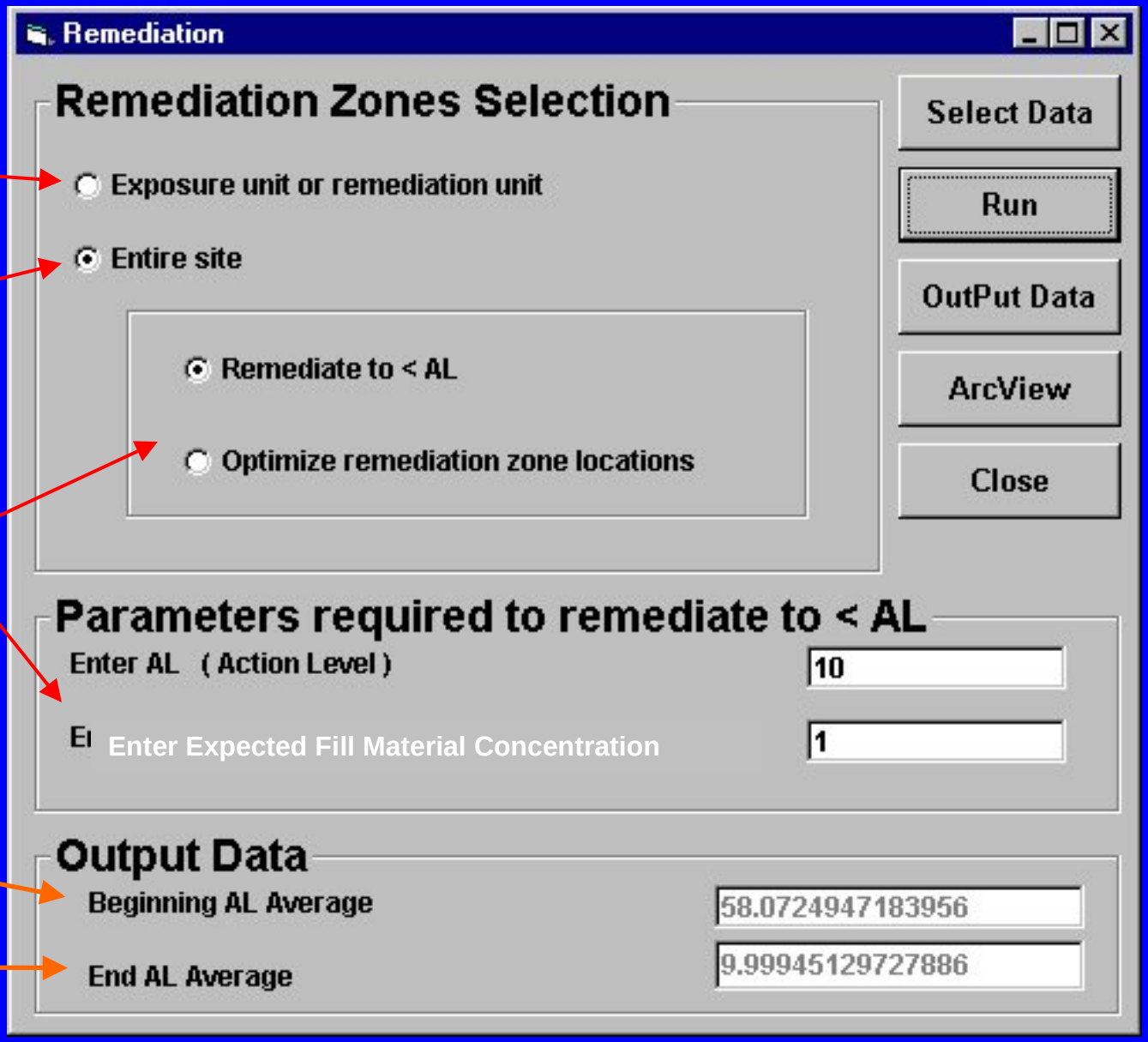
Block based

Site based

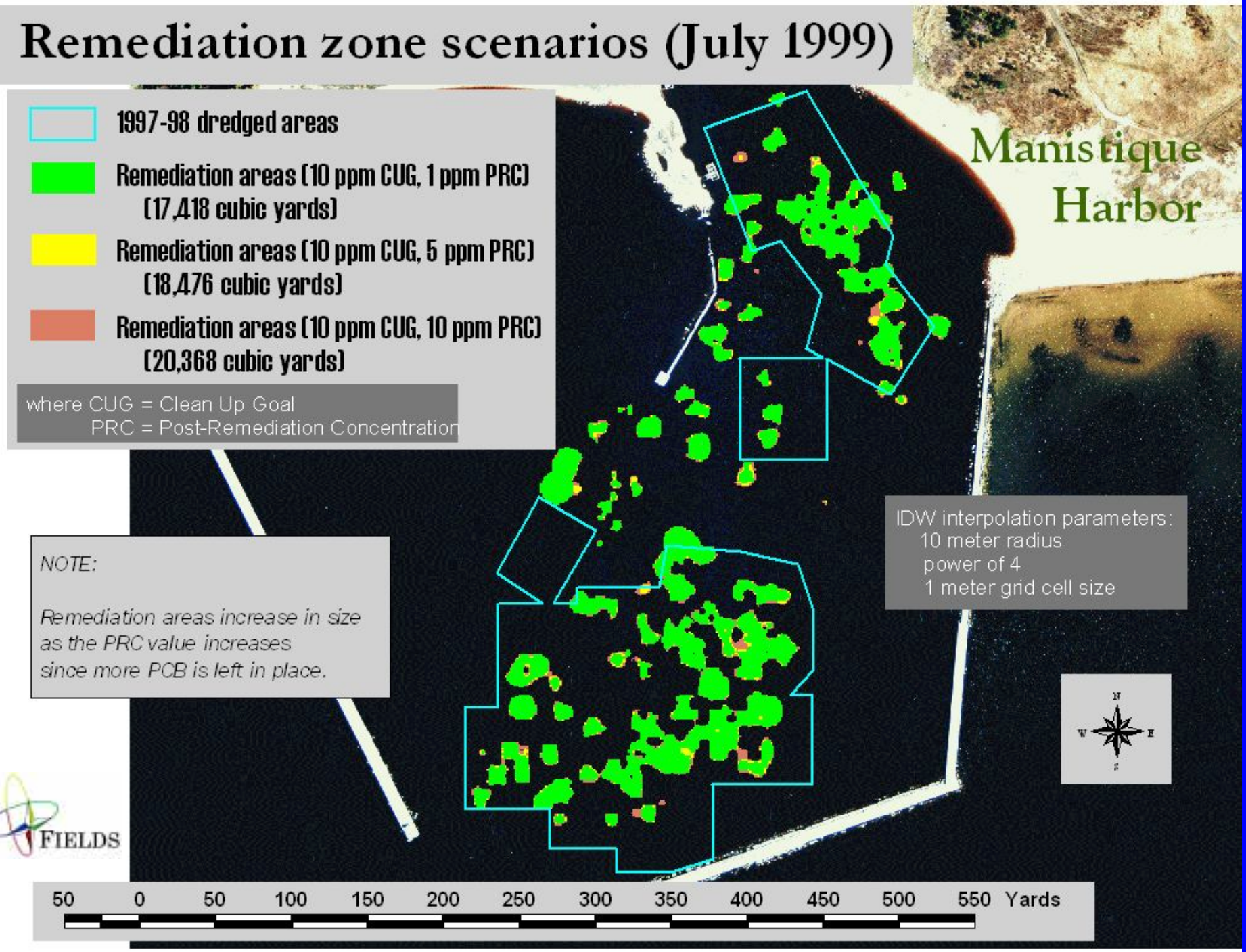
Remediation criteria

Before remediation PCB avg.

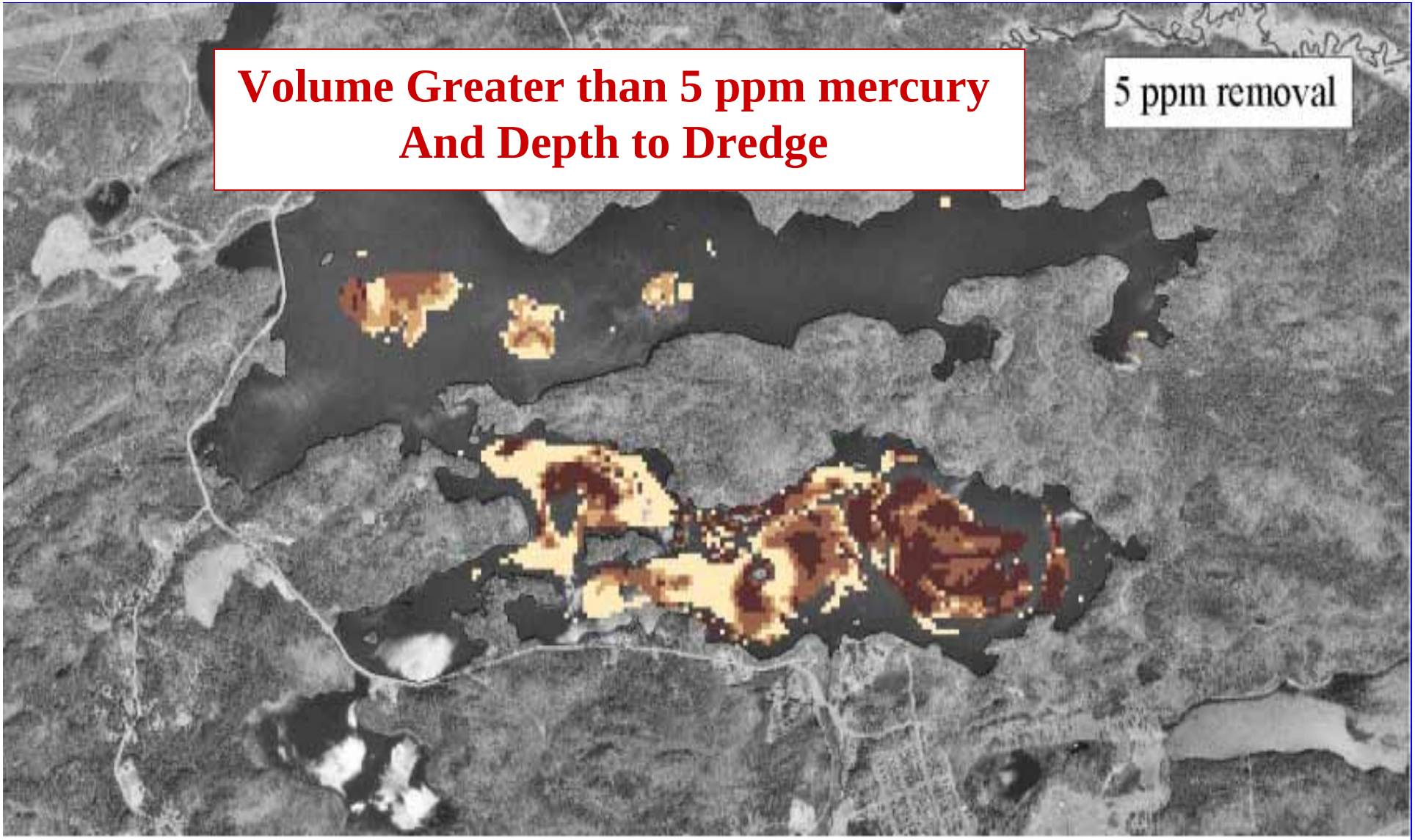
Expected after remediation PCB avg.



Remediation zone scenarios (July 1999)



Volume Greater than 5 ppm mercury And Depth to Dredge



Depth to Dredge

0.5 ft
1 ft
2 ft
3 ft

Deer Lake: Estimated volume determination for removal of all sediment with a mercury concentration equal or greater than 5 ppm. Deeper contaminated sediments generally lay beneath contaminated sediment meaning overburden is estimated to be low. Grid size is 20x20 meter (400 sq m). 3D interpolation of concentrations were performed in earthVision (Dynamic Graphics Inc.) 8 Jan. 01

Depth to less than 5 ppm of mercury conc.	Volume of sediment (cubic yards)
0.5 ft	70,200 cy
1 ft	59,800 cy
2 ft	208,000 cy
3 ft	356,000 cy
Total Volume	**694,000 cy**

3 Dimensional Visualization